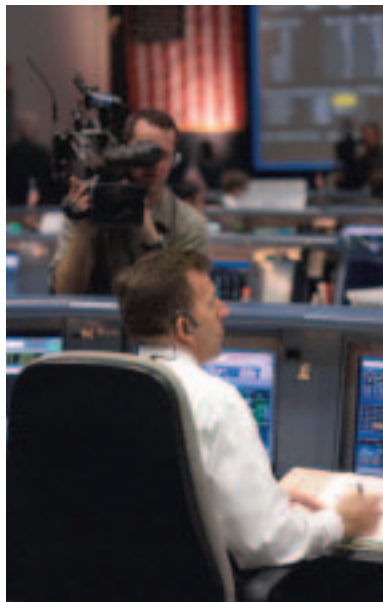


# Media day



NASA/Blair JSC2005E14219

Dozens of reporters, photographers and videographers descended upon Johnson Space Center during the week of April 4 for a series of STS-114 media briefings. The events included press conferences, crew interviews, exhibits and training demonstrations, all designed to help the media relay the Return to Flight story to the public.



NASA/Markowitz JSC2005E14036



NASA/Blair JSC2005E13836

## Space Center Roundup

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# Roundup

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## First we crawl, then we fly

Space Shuttle *Discovery* approaches the Rotating and Fixed Service Structures on Launch Pad 39B after rollout from the Vehicle Assembly Building. First motion began at 2:04 p.m. EDT April 6, and the Shuttle was hard down on the pad at 1:20 a.m. EDT April 7. The Shuttle sits atop the Mobile Launcher Platform and is transported by the Crawler-Transporter underneath. Launch of *Discovery* on its Return to Flight mission, STS-114, is targeted for May 15 with a launch window that extends to June 3. During its 12-day mission, *Discovery's* seven-member crew will test new hardware and techniques to improve Shuttle safety, as well as deliver supplies to the International Space Station.

**Explore. Discover. Understand.**

May  
2005  
Houston, Texas



# Beak sends...

A MESSAGE FROM CENTER DIRECTOR LT. GEN. JEFFERSON D. HOWELL JR.



## Coping with stress

JSC has always been a place of high energy, high stakes and high stress. It’s the nature of the beast. Giving people the ability to go into space, operate there and then return safely demands the highest in performance by all involved with little tolerance for error. That’s the way it has to be and that causes stress for all involved.

Add the *Columbia* tragedy, the following investigation and recovery, the Return to Flight activities, the uncertainties associated with the Exploration initiative, a change in Administrators and the hurdle of getting everything done for launch. Total all that up and the stress meter is definitely pegged to the right!

It’s obvious that stress is and will remain a significant part of our environment. All of us need to acknowledge this fact and then learn to deal with it. If you don’t, it can destroy your health. Hypertension, irregular heartbeat, inability to sleep, loss of appetite and depression are just a few examples of the unhealthy ramifications of not coping with stress.

There are many ways to reduce the negative aspects of stress. I have personally found that regular exercise, a brisk walk each morning accompanied by calisthenics, is a great way to clear the cobwebs in my brain and relieve personal pressure. Meditation, group activities, volunteer work, playing sports, seeking counseling and proper diet are just a few examples of how one can counter the negative aspects of stress. We have a great team of medical, physical fitness and counseling professionals here at JSC who are ready to help you find your own special way to relieve some of the stress in your life. Please seek their assistance.

We all owe it to ourselves, our families and our colleagues to maintain our good health. To do so we must first admit that we are being affected by our stressful environment and then take the necessary measures, including setting aside the necessary time each day, to cope with it. Let’s go for it!

IT’S GREAT TO BE ALIVE AND IN HOUSTON!

For information on managing stress and taking care of your health and family, contact:  
Employee Assistance Program, 281/483-6130  
Wellness Coordinator, Jennifer Blok, 281/483-0317  
Stress Management Resources: <http://ks.jsc.nasa.gov/thh/stress.htm>

## Shuttle Training Aircraft preps astronauts for landing

# Test drive

by Kendra Phipps

How do you help astronauts feel like they’ve landed the Space Shuttle hundreds of times without actually using a Shuttle?

That is one task given to research pilots at Johnson Space Center. They take the sleek Shuttle Training Aircraft (STA) and use it to train astronauts to land the massive-by-comparison Space Shuttle.

“Astronauts only get one try to land the Shuttle; it lands as a glider,” said Research Pilot “Triple” Nickel. “We use the very slick, sports car-like feel of the STA to simulate the ‘falling brick’ of the Space Shuttle.”

According to astronauts who have flown both, the STA gives a remarkably good simulation of a landing Shuttle.

“The STA is great! It flies very closely to the actual orbiter,” said STS-114 Commander Eileen Collins. “The handling qualities are close enough that we have no problems transitioning from training to the real thing.”

The STA is a “highly modified Gulfstream-2 aircraft,” Nickel said. The plane’s cockpit has been adapted to closely resemble a Shuttle flight deck; the left-hand seat features the same hand controls that a Shuttle commander uses during a mission. Several passenger seats in the back of the aircraft have been replaced by a bank of Shuttle-simulating computers.

“When a pilot flies the aircraft, he’s actually flying a computer model of the Shuttle,” Nickel said. NASA has four of these customized aircraft, most of which are kept at the NASA Forward Operating Location in El Paso, Texas. The fleet is rotated through Ellington Field for maintenance as needed.

Most of the STA training takes place at the White Sands Space Harbor, a part of the White Sands Test Facility in New Mexico. The location is ideal because it not only has an actual Shuttle landing strip – an STA training requirement – but it provides more remote, undisturbed airspace than its counterparts at Kennedy Space Center in Florida and Edwards Air Force Base in California.

Astronauts are shuttled to El Paso on another NASA training aircraft, the T-38. Each STA training session includes 10 approaches and landings. After a session, the training crew



The Shuttle Training Aircraft is used to teach astronauts to land the Space Shuttle.

refuels the aircraft, picks up a different astronaut and begins again.

“STA training is all about producing a familiar path through the sky for the astronauts,” Nickel said. “No matter the height of the astronaut, we put their eyes at a consistent height so when they fly the Shuttle, the view looks familiar. We even mask off the windows to match the view from a Shuttle.”

The STA flies at the same speeds, dive angle and approach trajectory as the Shuttle. But simulating that “falling brick” feeling is a delicate maneuver.

“To accomplish that, we lower the main gear of the STA and put the engines in reverse thrust,” he said. “You know when a commercial plane lands and you’re thrown forward after the wheels touch down? We do that at 30,000 feet.”

Prior to a Shuttle mission, a commander has to complete 1,000 STA landings. The STS-114 Commander and Pilot, Eileen Collins and Jim Kelly, will continue STA training on a weekly basis until launch. Such thorough practice leads to confident astronauts and successful Shuttle landings – not to mention great feedback for the STA teams.

“Shuttle astronauts come back and tell us it felt like they had done it a thousand times before,” Nickel said.

“It is some of the best training we have,” Collins said.

# TURNING DOWN THE HEAT WITH COOL INVENTION

by Brad Thomas

## A TRIP TO A LOCAL DISCOUNT RETAILER

and a little ingenuity led to a “cool” invention for two Cooperative Education Program (co-op) students at JSC. Garret Fitzpatrick and Josh Hunter designed a way to keep the astronauts cool while training in their flight suits.

The device, called the Multiple User Cooling Unit (MUCU), is used to keep astronauts comfortable when they are not in the Shuttle Simulator at Johnson Space Center (JSC). The astronauts are hooked up to the simulator’s system while inside.

MUCU consists of a swirling maze of copper tubes inside a regular ice chest. A water pump mounted on top of the chest forces water through the tubes, where it is cooled by ice water inside the chest. The water is then pumped through the right pant leg of the flight suit in a series of tubes.

Fitzpatrick, currently a senior at the University of Wisconsin, worked on the project during his internship at JSC in the fall of 2003. He said that he was given the challenge by NASA to develop a cooling system that could be used by several astronauts. Fitzpatrick came up with the initial design and built the prototype. He took the cheap route.

“Basically, I was looking for the solution that was the simplest,” he said. “It was better to do that than to throw thousands of dollars into the system.”

Hunter, who is currently a junior aerospace engineering major at the Georgia Institute of Technology, made some modifications to the design and prepared it for use during crew training in the summer of 2004. One of the modifications included enclosing the pump in a case to reduce noise.



The STS-121 crewmembers await the start of an emergency egress training session in the crew compartment trainer (CCT-1). The CCT is one of several Shuttle-training components located in the Space Vehicle Mockup Facility at Johnson Space Center. Pictured, from the left, are Astronauts Steven W. Lindsey, commander; Mark E. Kelly, pilot; Lisa M. Nowak, Michael E. Fossum and Piers J. Sellers, all mission specialists.

Hunter was surprised with the simplicity of the design. “When I first saw it, I was shocked,” he said. “But when I began to work with it, it made sense to me.”

Ethan Reid, a lead project engineer in the Shuttle Crew Escape Lab at JSC, worked with the students on the project. He said the MUCU design is more efficient than the individual briefcase-like device previously used, which he described as cumbersome and loud. With MUCU, four astronauts can be hooked up at one time. “It is much easier to deal with,” Reid said. “It is mobile.”

According to Reid, MUCU is used as often as possible. The STS-114 crew, which is slated to fly on NASA’s Return to Flight mission this month, and the STS-121 crew have both used the MUCU during training. The 2004 Astronaut Candidate Class has also recently been cooled by the MUCU.

Reid said that Fitzpatrick and Hunter seemed to be excited about their work at NASA and on the MUCU project. “They are really smart guys,” Reid said. “It was fun to have them around because they wanted to learn.”

Fitzpatrick said that he and Hunter are good friends and they are both planning to return to NASA this summer for another tour as co-ops. Fitzpatrick said that he has enjoyed his first tour with the Agency and that it was not what he expected.

“I was surprised at the level of responsibility,” he said. “It was a great challenge. I was treated as an equal, instead of just getting busy work.”

Hunter said he had an interest in working with NASA as a fifth grader. “When I was younger, I wanted to be an astronaut,” he said, “and I still do. I knew NASA was a great place to be.”

The Cooperative Education Program at JSC is open to graduate and undergraduate students from around the country. A co-op regularly alternates semesters at school with semesters at JSC working in a paid, full-time position directly related to the student’s particular field of study.





NASA KSC-05PD-0613

# Space Shuttle *Discovery* at launch pad for Return to Flight

The Space Shuttle *Discovery* is at the launch pad. Following more than two years of safety modifications and vehicle upgrades, *Discovery* arrived at Launch Pad 39B at NASA's Kennedy Space Center, Fla., around 12:30 a.m. EDT on April 7.

"This is a big milestone," William Readdy, NASA associate administrator for Space Operations, said, "and what a welcome sight to see *Discovery* at the pad, especially knowing the work we're doing to make it a stronger vehicle. But we're not finished yet. There are still some important milestones we're working toward before we're ready to fly," he added.

"Having *Discovery* on the pad puts us one step closer to resuming the Space Shuttle's important mission of supplying and assembling the International Space Station," Michael Kostelnik, NASA deputy associate administrator for International Space Station and Space Shuttle Programs, said.

*Discovery's* journey to the launch pad from the Vehicle Assembly Building (VAB) was a slow and careful one. The fully assembled Space Shuttle Vehicle "stack" that includes the orbiter, the External Tank and the twin Solid Rocket Boosters, was mounted on the Mobile Launcher Platform. The whole assembly was carried to the launch pad on a vehicle known as a Crawler-Transporter. The Crawler's maximum speed during the four-mile journey was less than one mile per hour.

Left: At NASA's Kennedy Space Center, Space Shuttle *Discovery*, atop the Mobile Launcher Platform, crawls toward Launch Complex 39B. Barely visible on the horizon at right is Pad 39A.



NASA KSC-05PD-0619

Above: The orange glow of the setting sun paints a silhouette of Space Shuttle *Discovery* as it rolls out to Launch Pad 39B at NASA's Kennedy Space Center.

Right: The Space Shuttle *Discovery* is viewed from the side as it sits atop the Mobile Launcher Platform rolling out to Launch Complex 39B.

*Discovery's* rollout was not without its challenges. Shortly before moving it out of the VAB, *Discovery* and its propulsion elements were thoroughly inspected and engineers spotted a tiny, hairline crack in the External Tank's insulating foam. After reviewing the data, engineers determined the crack, on the opposite side of the tank from the orbiter, was not in a location where it could become hazardous. The "go" was then given for roll.

"We plan to reassess the area during and after a tanking test we have planned for next week, but based on our preliminary analysis, we don't expect to have to repair the crack," Sandy Coleman, External Tank project manager, said.

Several hours later, when *Discovery* neared the pad, the mechanism that keeps the Shuttle level as it moves up a ramp gave conflicting readings. The process was stopped, the issues were addressed, and the Shuttle was moved securely onto the pad.

Now at the launch pad, the Space Shuttle will undergo final connections for launch, and a pressurized cargo container will be installed. The special "tanking test" – another step

verifying design modifications to the External Tank – on April 14 will check out the Space Shuttle.

"This milestone signifies an outstanding effort of thousands of people throughout the country who came together as a team to ensure a safe Return to Flight," said Bill Parsons, Space Shuttle program manager. "I have tremendous confidence in their work," he said.

Launch of *Discovery* for its Return to Flight mission, designated STS-114, is targeted for May 15, with a launch window that extends until June 3. During their 12-day mission, Commander Eileen Collins and the rest of *Discovery's* seven-person crew will test new hardware and techniques to improve Shuttle safety, as well as deliver supplies to the International Space Station.



NASA KSC-05PD-0612



# Chickens on the NASA prairie

by Johannes T. Ragin



*The ground-dwelling Attwater's Prairie Chicken is a medium-sized grouse with brown, black and buff-colored feathers.*

**URBANIZATION AND HABITAT LOSS** pose a serious threat to much of the wildlife in the Gulf Coast region. When settlers first arrived in Texas, more than 6 million Attwater's Prairie Chickens could be found scattered over the Texas Gulf coast. Today, this bird is an endangered species and estimates are that fewer than 50 remain in the wild. In an attempt to survive, the prairie chicken will be moving back to the NASA prairie for an extended stay.

"Due to habitat loss and the fact that the prairie chicken was an important resource to early settlers of the Gulf Coast region, the numbers have dropped dramatically," Sandra Parker, environmental specialist at JSC, said.

In Texas, the bird survives at only two remaining preserves: the Attwater's Prairie Chicken National Wildlife Refuge near Eagle Lake and the Nature Conservancy's Refuge near Texas City. To prevent extinction of this prairie chicken species, the Houston Zoo participates in the U.S. Fish and Wildlife Services' statewide Recovery Program.

The Zoo constructed a small exhibit area to breed and raise the chicks until they are old enough to be relocated to the preserves. Unfortunately, Houston's growth and the noise level of the Medical Center have disturbed the birds at the Zoo's area, making breeding this rare species much more difficult.

*The males have golden neck sacks that, during mating season, they use to produce a booming sound that can be heard for half a mile.*



## The Prairie Chicken Partnership not only benefits the Houston Zoo but JSC as well.

To combat the unfavorable conditions, the Zoo's then-president Philip Cannon initiated a partnership with JSC to set aside one-half acre of NASA prairie, located south of Bldg. 424, to house the chickens.

JSC approved the partnership and a Space Act Agreement was drawn up to clarify the Zoo's responsibility in the project. Under this agreement, the Houston Zoo has sole responsibility for the assembly and maintenance of the project. Houston Zoo employees will work on site at JSC to manage and maintain the prairie chickens.

The partnership's genesis grew out of a chance meeting between Cannon and Howell. "As they talked about the missions of their respective organizations, it became clear there were areas of common interest and concern," Parker said.

"The JSC Team is excited about this partnership," JSC Director, Jefferson D. Howell Jr., said. "Part of NASA's mission is to understand and protect our home planet, and we are happy to play a small part in preserving the Attwater's Prairie Chicken population. This project also provides students an opportunity to see for themselves the important role that environmental management plays here on Earth and as humans venture further into space."

JSC employees are encouraged to avoid the prairie chicken habitat. The quiet and serene environment that JSC provides is what makes JSC such a promising location to raise these birds. Frequent visits could put stress on the birds and possibly disrupt the breeding process.

"JSC is a great location for the prairie chickens for a variety of reasons," Gail Johnson, assistant director for the Houston Zoo, said. "The land JSC has been able to offer is very quiet. Also, NASA is very secure and to find a remote location that is also patrolled 24/7 is not as easy as it looks. The area JSC is providing for the project is adjacent to a very wide prairie-like setting. We think this is very conducive for these birds."

The Prairie Chicken Partnership not only benefits the Houston Zoo but JSC as well. The project will be part of JSC's educational outreach program, which seeks to foster the next generation of explorers by encouraging young people to study math and science. The facility will give area students an opportunity to see first-hand the importance of habitat conservation and protection.

"This project is tied back to our NASA mission, to increase educational opportunities, and to protect the home planet," Parker said.

# Decisions, decisions...

Decision-making tool to help JSC team members with choices big and small

by Kendra Phipps

Every day, we make hundreds of little decisions. Which shirt should I wear? What's the fastest route to work? What do I want for dinner?

Most of us have no trouble making these choices day in and day out. But a more complex dilemma – such as whether a Space Shuttle can safely launch – calls for a more complex thought-process.

Decisions such as these often involve technical information, conflicting opinions and pressing deadlines. These tense situations are a part of the “NASA Culture” that the *Columbia* Accident Investigation Board (CAIB) criticized after the *Columbia* accident.

To help facilitate these complex decisions – and improve communication and culture in the process – the Johnson Space Center Joint Leadership Team (JLT) has introduced the Decision-Making Process Model. The Extravehicular Activity (EVA) Office has been testing the model for several weeks.

“The model has a strong emphasis on helping us in the cultural change of dissenting opinions,” said EVA Office Deputy Manager Glenn Lutz. “We’re all trying to make that cultural change. I think this will help people in that regard.”

The JLT was formed to address leadership and culture issues raised by the CAIB and by employee discussions during Safety and Mission Success Week in 2003. The JLT consists of senior

NASA officials and senior contractor management, who work as a collaborative team.

“NASA – and JSC in particular – is committed to a safety first attitude. This new decision-making model helps ensure we maintain that focus on safety as a priority in everything we do. Every one of us – from those who maintain facilities to those who oversee spaceflight – shares this commitment and this model helps unite all of us in that cause,” Bill Parsons, manager of the Space Shuttle Program, said.

The Decision-Making Process Model was developed in line with the JLT’s objectives of improving leadership capabilities, processes and culture across the Center. It was designed to standardize the decision-making process across JSC.

The model is located at <http://decisionmodel.jsc.nasa.gov/> and includes access to a number of tools, tips and resources for employees and decision-makers. For example, a set of detailed presentation templates is available for the most common types of JSC presentations. For issues that are too complex to fit easily into a slide presentation format, the Web site also provides a standardized white paper template.

The model also walks users through the decision-making process. It provides a detailed flow-chart indicating how to make sure everyone’s opinion is heard and what to do if there

are dissenting opinions after the decision has been made.

Lutz said he thinks the training and testing within the EVA Office has been successful so far.

“As with all things, there’s a learning curve, but we think it’s going to be beneficial and will ensure consistency,” Lutz said.

The Decision-Making Process Model can be used for any decision at JSC, from whether to paint an office to whether to launch a Shuttle. Lutz said that the EVA teams have been using the model for many types of decisions involving technical information, configuration control changes and problem descriptions. He said that the model will be used to determine flight readiness for future Shuttle missions.

Center-wide employee training on the Decision-Making Process Model will begin soon.

“This is just common sense,” Lutz said of the model. “It’s the right thing to do.”

